

Date: Wed, 2 Mar 94 04:30:20 PST
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V94 #52
To: Ham-Ant

Ham-Ant Digest Wed, 2 Mar 94 Volume 94 : Issue 52

Today's Topics:

 160m Inverted L
 160M on G5RV
 AEA ISOLLOOP
 Cushcraft R7 on Towers (2 msgs)
 grounding a ground plane?
Looking for an Active Antenna Matching Circuit/Amplifier
 mechanical analogue of radiation resistance?
 MicroSmith (2 msgs)
 Need help with TV antenna
 PHASED VERTICALS (2 msgs)
 Simple Signal Question (2 msgs)

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: 28 Feb 1994 18:35:18 GMT
From: ihnp4.ucsd.edu!sdd.hp.com!nigel.msen.com!yale.edu!noc.near.net!
jericho.mc.com!fugu!levine@network.ucsd.edu
Subject: 160m Inverted L
To: ham-ant@ucsd.edu

I have a 50' tower that I would like to use somehow
to help construct an inverted L for 160. Is an
inverted L with a 50' height and a flat top section
of about 100' usable on 160? Anyone know where to
find some design guide, like radial placement etc..

My reference materials don't seem to cover this type
of antenna.

```

      ||  // ||\ \      //||      // \ \      // \ \
      ||  // ||  \ \    // ||      //      //      //
      ||//      ||  \ \      ||  //      //      //
      ||\ \      ||  ||      ||  \ \      ===  \ \      ===
      ||  \ \      ||  //      ||  \ \      //      \ \      //
      ||  \ \      ||  //      ||  \ \      //      \ \      //

```

-----FTAC
Bob Levine KD1GG 7J1AIS VK2GYN formerly KA1JFP
levine@mc.com <--Internet email Phone(508) 256-1300 x247
kd1gg@walphy.ma <--Packet Mail FAX(508) 256-3599

Date: 1 Mar 94 14:21:43 GMT
From: news-mail-gateway@ucsd.edu
Subject: 160M on G5RV
To: ham-ant@ucsd.edu

Greetings :

I have run a G5RV on 160 directly. I run the balanced line
directly to the tuner and can run on 80 - 10 quite reliably.

To get it to load on 160 with a Vectronics tuner (same design as
MFJ) I had to tie the two wires from the feedline to the Long Wire
output from the tuner and work it against a good ground. This worked
adequately, but the feedline radiates and you have a flat-topped
vertical.

Using a Drake MN2700 tuner I can get it to load differentially
(the normal way) at least over part of the band. The Drake has a
switchable 1:1 to 4:1 balun built in, which allows you to match higher
impedances. It is also a Pi network rather than a T, which is better in
some cases (worse in others.)

Since the G5RV is just a short random length dipole on 160,
anything you add to lengthen it will help bring the efficiency up.
Certainly the suggestions to double the length is fine if you have the
room. Note that if you do double the length you will have a 3/2 wave
antenna on 40 and if you can get it up high enough, you should get
performance on 40 comparable to what a G5RV gives on 20 (the band it was
designed for). See this month's QST on random length dipoles.

Alan, VE4AKM
mcilwaina@wl.aecl.ca

Date: Mon, 28 Feb 1994 03:23:46 GMT
From: ihnp4.ucsd.edu!swrinde!gatech!asuvax!pitstop.mcd.mot.com!mcdphx!schbbs!
mothost!mdisea!uw-coco!nwnexus!ole!ssc!tad@network.ucsd.edu
Subject: AEA ISOL00P
To: ham-ant@ucsd.edu

In article <CLr2KB.92p@cbnews1.cb.att.com> ajg@cbnews1.cb.att.com
(anthony.j.gaeta) writes:
>I would like to have your opinion on the ISOL00P Antenna?
>Is it worth its price? If not, what type of antenna
>would you recommend in its place?
>

Its expensive. If you don't want to spend the money, I suggest
getting an antenna tuner with balanced output, and center feedeing
a random length of wire with balanced twinlead.

--
tad@ssc.com (if it bounces, use 3288544@mcimail.com) | [put "attn Box #215"
Tad Cook | Packet Amateur Radio: | Home Phone: | on fax or cover pg!]
Seattle, WA | KT7H @ N7DUO.WA.USA.NA | 206-527-4089 | FAX: 206-525-1791

Date: 28 Feb 1994 18:49:12 GMT
From: ihnp4.ucsd.edu!swrinde!elroy.jpl.nasa.gov!usc!howland.reston.ans.net!
noc.near.net!jericho.mc.com!fugu!levine@network.ucsd.edu
Subject: Cushcraft R7 on Towers
To: ham-ant@ucsd.edu

In article 762072430snx@bsdihi.atr.bso.nl, dihi@bsdihi.atr.bso.nl (Dick Hissink)
writes:

-->
--> Therefor I decided not to buy the R7 but mount an ordinary doublet
--> of 2 times 20 mtrs with an open feeder and symetrical atu.
-->
--> Advantage is the tunablity of this system on all bands.
-->
--> Also the R7 isn't realy performing on 80 mtrs.
-->
--> Regards,
-->
-->Dick Hissink PA3DSP

-->Email:dihi@bsdihi.atr.bso.nl

It wasn't designed for 80m either.

R7 := 7 bands (10,12,15,17,20,30,40)

```
-----
      ||  //  ||\\  //||  //\\  //\\
      ||  //  ||  \\  //  ||  //  //
      ||//  ||  \\  ||  //  //  //
      ||\\  ||  ||  ||  \\  ===  \\  ===
      ||  \\  ||  //  ||  \\  //  \\  //
      ||  \\  ||  //  ||  \\//  \\//
```

-----FTAC
Bob Levine KD1GG 7J1AIS VK2GYN formerly KA1JFP
levine@mc.com <--Internet email Phone(508) 256-1300 x247
kd1gg@wa1phy.ma <--Packet Mail FAX(508) 256-3599

Date: 28 Feb 1994 18:47:07 GMT
From: ihnp4.ucsd.edu!swrinde!elroy.jpl.nasa.gov!usc!howland.reston.ans.net!
noc.near.net!jericho.mc.com!fugu!levine@network.ucsd.edu
Subject: Cushcraft R7 on Towers
To: ham-ant@ucsd.edu

In article 762072430snx@bsdihi.atr.bso.nl, dihi@bsdihi.atr.bso.nl (Dick Hissink) writes:

-->
-->In article <1994Feb23.210952.8336@picker.com> CUNNINGHAM_A@whqvax.picker.com writes:
-->
--> >
--> >
--> >
--> > Has anyone put a Cushcraft R7 at the top of a tower ? Two
--> > of us here in Cleveland are considering doing this. We are concerned
--> > about windloading, etc.

.
. .
. .
. .
-->

```

--> I had the same plans here in the Netherlands but was advised not to
--> do so. Even if the R7 is mounted on the ground I was advised to use
--> guide wires. We have some storms every year and the mechanical
--> construction of the R7 doesn't look like a storm survivor!
-->
--> Therefor I decided not to buy the R7 but mount an ordinary doublet
--> of 2 times 20 mtrs with an open feeder and symmetrical atu.
-->
--> Advantage is the tunability of this system on all bands.
-->
--> Also the R7 isn't really performing on 80 mtrs.
-->
--> Regards,
-->
--> Dick Hissink PA3DSP
--> Email: dihi@bsdihl.atr.bso.nl

```

I have had an R7 mounted on my chimney (a 3 flue job) with 3 custom stainless steel brackets I made for > 2 years now. It withstood 80mph winds last March while caked with ice. I have seen it bent at least 30 degrees from vertical. It is still as vertical (with no wind) now as it was when I installed it. It still works the same and I will never sell it, even though I have since constructed a tower. Although I have a G5RV, I still prefer it for WARC and 40m DX.

If anyone is considering buying one (R7) and wants to see it's SWR curves, send me a SASE and I'll send you the printout from my AEA HF SWR Analyzer. (I built the interface to the PC for that great thing!)

```

-----
||  // ||\ \  //||  // \ \  // \ \
||  // || \ \  // ||  //      //
||//  || \ \  ||  //      //
||\ \  ||  ||  ||  \ \  == \ \  ==
|| \ \  ||  //  ||  \ \  //  \ \  //
||  \ \  ||  //  ||  \ \  //

```

```

-----FTAC
Bob Levine  KD1GG 7J1AIS VK2GYN          formerly KA1JFP
levine@mc.com  <--Internet email      Phone(508) 256-1300 x247
kd1gg@wa1phy.ma <--Packet Mail        FAX(508) 256-3599
-----

```

Date: 28 Feb 1994 23:42:57 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!news.umbc.edu!eff!
news.kei.com!ssd.intel.com!chnews!scorpion!jbromley@network.ucsd.edu
Subject: grounding a ground plane?
To: ham-ant@ucsd.edu

In article <1994Feb26.193431.104096@ns1.cc.lehigh.edu>,
DAVID M. ROSEMAN <c002@ns1.cc.lehigh.edu> wrote:

>how to i ground a ground plane antenna for lightning protection?

>ground the ground?

>or just get a inline coax protector?

One scheme I have seen on commercial antennas is to make the
vertical element a folded monopole. This places the entire
antenna at DC ground.

The problem with this is that terminal impedance climbs to
something like 150 ohms. To avoid this, the two conductors
of the folded monopole are made with different diameters.
By making the conductor connected to the center insulator
something like 10x the diameter of the ground-connected
conductor, most of the RF current flows in that conductor
and the terminal impedance returns to something close to
50 ohms.

Jim, W5GYJ

Date: Tue, 1 Mar 1994 00:36:14 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!
howland.reston.ans.net!torn!news.ccs.queensu.ca!eleceng.ee.QueensU.CA!
toloo@network.ucsd.edu
Subject: Looking for an Active Antenna Matching Circuit/Amplifier
To: ham-ant@ucsd.edu

Hello:

I am looking for an active circuit diagram that can amplify and
also certain frequency ranges of the signals received by the
antenna. Do you know where I can get such a circuit (a paper
drawn or the postscript file of its circuit diagram)

Thank You
Mansour

Date: Mon, 28 Feb 1994 20:20:46 GMT
From: ihnp4.ucsd.edu!sdd.hp.com!col.hp.com!srngenprp!alanb@network.ucsd.edu
Subject: mechanical analogue of radiation resistance?
To: ham-ant@ucsd.edu

Alan M. Horowitz (horowitz@nosc.mil) wrote:
: Mostly, we can find mechanical analogues to electrical phenomena.

: What is the mechanical analogue of radiation resistance?

In an automobile, horsepower is like the transmitted power into an antenna.

The rolling resistance and wind resistance (i.e. power required to make the car go) are like the radiation resistance of an antenna.

The power loss in the engine, transmission and drivetrain is like the antenna loss resistance, due to conductor resistance and losses in the matching network (if any).

AL N1AL

Date: Mon, 28 Feb 1994 18:17:16 GMT
From: news@lanl.gov
Subject: MicroSmith
To: ham-ant@ucsd.edu

Is there anywhere on the net or a BBS that specializes in antenna codes. I am looking for the subject code to optimize my antenna farmette. The xyl prefers that it does not grow into a full blown farm. Thanks for any info.
Gerald Schmitt KC5EGG

Date: 28 Feb 94 18:34:33 GMT
From: news.tek.com!tekig7!tekig6!royle@uunet.uu.net
Subject: MicroSmith
To: ham-ant@ucsd.edu

ggs@lanl.gov (Gerald Schmitt KC5EGG):

>Is there anywhere on the net or a BBS that specializes
>in antenna codes. I am looking for the subject code to
>optimize my antenna farmette. The xyl prefers that it does

>not grow into a full blown farm.Thanks for any info.

MicroSmith isn't shareware. It can be purchased from the ARRL for the very reasonable price of \$39.00. If anyone does find it on a BBS, please notify the ARRL.

Roy Lewallen, W7EL

Date: Mon, 28 Feb 1994 16:55:40 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!gatech!
wa4mei.ping.com!ke4zv!gary@network.ucsd.edu
Subject: Need help with TV antenna
To: ham-ant@ucsd.edu

In article <2kgenl\$k9q@canopus.cc.umanitoba.ca> umcaner0@cc.umanitoba.ca (Richard Theodore Caners) writes:

>Hello. Sorry to post a question about TV antennas on this group,
>but I didn't know where else to go.
>

>What I would like to build is an antenna that can pick up a TV
>station that broadcasts approximately 115 Kilometers away from me.
>Obviously, I would like to have the antenna as small as possible.
>I have been told that a 40 metre dipole antenna does the trick, but
>this prompts two questions 1) Is this the best antenna for this
>situation? and 2) How do you build a dipole antenna?

1) a 40 meter dipole is **not** a good antenna choice for this problem.
2) a dipole is just two pieces of wire, each 1/4 wavelength, arranged
end to end with a feedline connected at that juncture, with coax, shield
to one wire, center conductor to the other.

>If someone could give me some help or point me in the right direction
>it would be greatly appreciated.

What you **really** want is a good high gain yagi antenna cut for the frequency of the station you want to receive, and mounted as high and in the clear as possible. Channelmaster makes good ones, or you can build your own using instructions in The ARRL Antenna Book for VHF antennas, and scaling the size of the antenna for the frequency of the station you want to receive. A mast mounted preamp may, or may not, help. If there are strong local signals around, a preamp may do more harm than good.

Receiving a station 115 km away is generally not a difficult task, unless there is rough terrain in between. Most deep fringe commercial yagi antennas are easily up to the job if you can get them high enough

in the air.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: Mon, 28 Feb 1994 19:43:40 GMT
From: ihnp4.ucsd.edu!sdd.hp.com!hp-cv!hp-pcd!hpspk1a!depaul@network.ucsd.edu
Subject: PHASED VERTICALS
To: ham-ant@ucsd.edu

Hello Folks.

About a month ago I heard a guy on 75 using a multiband phased vertical array (two elements). He was using it on 20/30/40/80...directive on all those bands. He referenced CQ mag, I think August '89. Could someone please send me a copy of that? Or a FAX??

(Recall, I asked the question, about a half year ago, if it was possible to have a multiband two element vertical phased array... THERE IS, contrary to some saying it was "impossible"...Ha!)

Regards,

Marc DePaul
depaul@hpspkfsf.spk.hp.com

Date: Mon, 28 Feb 1994 20:55:01 GMT
From: ihnp4.ucsd.edu!sdd.hp.com!col.hp.com!fc.hp.com!jayk@network.ucsd.edu
Subject: PHASED VERTICALS
To: ham-ant@ucsd.edu

Marc DePaul (depaul@spk.hp.com) wrote:

: (Recall, I asked the question, about a half year ago, if it was
: possible to have a multiband two element vertical phased array...
: THERE IS, contrary to some saying it was "impossible"...Ha!)
: Regards,
: Marc DePaul

Its very easy to do a broadside pattern. That doesn't require any phase lines. Just feed the antennas in phase and match them. Where the fun begins is with the endfire pattern. You will likely need a phasing line for each band which can be switched in and out. Not too hard, just need to make a relay box and have a fair amount of coax. Some spacings work better than others for pattern and gain (see ARRL Antenna Book) so all the bands won't have a optimum pattern.

You might check out the phased vertical articles in the Antenna Book by W7EL (I think). They give a lot of good info on keeping your pattern clean (but have your calculator handy).

73, Jay K0GU jayk@fc.hp.com

Date: Mon, 28 Feb 1994 17:25:40 GMT
From: dac!gd@decwrl.dec.com
Subject: Simple Signal Question
To: ham-ant@ucsd.edu

In article <2kk57u\$rt9@sugar.NeoSoft.COM> dlc@sugar.NeoSoft.COM (Dane L. Cantwell) writes:

>
>A friend and I were talking about cellular phones. He is in the market
>for one and we were talking about the merits of a "full size" phone at 3
>watts versus a portable at 0.6 watts. It was my point that the extra
>transmission power is discounted because the signal received at tower is
>related to the square of the distance to the tower.... therefore you
>don't get anything like 5 times the range with a 3 watt model over a 0.6
>watt unit. Is this right in theory? How about the real world?
>
>I realize that the assumption I am making assumes a point source that
>would radiate in all directions. How close is this assumption to the
>real world antennas? Comments please.
>
>Dane Cantwell - dlc@neosoft.com
>Petroleum Engineer

Actually, path loss for most non-line-of-sight mobile radio environments with lots of multipath is proportional to the fourth power of the distance (40 dB per decade, or 12 dB for every doubling in distance) [Ref. W.C.Y.Lee, _Mobile Cellular Telecommunications Systems_, McGraw-Hill, NY, NY, 1989.].

Here's how I figure the range that the extra power will give you:

The difference in power between the radios is $10 \times \log(3W/0.6W) = 7 \text{ dB}$

Now, substitute that 7 dB into 40-dB-per-decade path-loss equation:

$$7 \text{ dB} = 40 \times \log(\text{distance_with_}3W / \text{distance_with_}0.6W)$$

$$\begin{aligned} \Rightarrow \text{distance_with_}3W &= 10^{(7\text{dB}/40)} \times \text{distance_with_}0.6W \\ &= 1.5 \times \text{distance_with_}0.6W \end{aligned}$$

So the extra power only buys you an extra 50% in range.

In rural areas, where the size of cells is very large, one might need the extra power to communicate when near the edge of the cells (that extra 50% in range will increase your coverage area by a factor of 2.25). In urban areas, however, cells are made relatively small to boost the capacity of the system (smaller cells mean that the same frequencies can be reused for other conversations more often in other cells) and high power is rarely necessary at the edge of cells. In fact, the system will command your high-power radio to reduce its power!

Hope this helps!

Greg
AA6B0
gd@cellnet.com

Date: Mon, 28 Feb 1994 10:07:29 -0500
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!asuvax!pitstop.mcd.mot.com!mcdphx!
schbbs!mothost!lmpsbbs!NewsWatcher!user@network.ucsd.edu
Subject: Simple Signal Question
To: ham-ant@ucsd.edu

In article <2kk57u\$rt9@sugar.NeoSoft.COM>, dlc@sugar.NeoSoft.COM (Dane L. Cantwell) wrote:

>
> A friend and I were talking about cellular phones. He is in the market
> for one and we were talking about the merits of a "full size" phone at 3
> watts versus a portable at 0.6 watts. It was my point that the extra
> transmission power is discounted because the signal received at tower is

> related to the square of the distance to the tower.... therefore you
> don't get anything like 5 times the range with a 3 watt model over a 0.6
> watt unit. Is this right in theory? How about the real world?
>

Not only is this true, but to avoid overloading at the cellular receivers,
the system AUTOMATICALLY reduces power of the field transmitter (in 5 6 dB
steps, from 6 to 30 dB). Thus, unless you are always out in the fringes,
your 3 watt phone will probably be turned back by 6 dB or more, making it
equivalent or less actual power output than the portable. The reason the
3-watt unit may run at LESS power than the portable is due to the relative
efficiencies of the antennas; the ERP should be the same +/- 3 dB.
Now for the real tradeoff: To power a 3 watt transmitter DOES take 5 times
the current, and battery weight per watt IS a nearly linear function. The
higher power full-size unit will have a battery weight of 5 times that of
the portable 0.6W unit, although with the automatic power cutback
circuitry, it isn't usually needed.

>
> I realize that the assumption I am making assumes a point source that
> would radiate in all directions. How close is this assumption to the
> real world antennas? Comments please.

Your assumption is valid at the distances and frequencies involved.

>
> Dane Cantwell - dlc@neosoft.com
> Petroleum Engineer

--
Karl Beckman, P.E. < STUPIDITY is an elemental force for which >
Motorola Comm - Fixed Data < no earthquake is a match. -- Karl Kraus >

Some of the opinions expressed above aren't even claimed by the author!
Amateur radio WA8NVW @ K8MR.NEOH.USA.NA NavyMARS VBH @ NOGBN.NOASI

End of Ham-Ant Digest V94 #52

